



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,054	07/11/2003	John R. Mihalisin	MP247C	4320
7590 06/27/2005 Eckert Seamans Cherin & Mellott, LLC Alcoa Technical Center, 100 Technical Center Drive Alcoa Center, PA 15069-0001			EXAMINER SHEEHAN, JOHN P	
			ART UNIT 1742	PAPER NUMBER

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/618,054

Applicant(s)

MIHALISIN ET AL.

Examiner

John P. Sheehan

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/8/2003
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claims 5 and 9 are objected to because of the following informalities:

I. In claim 5, line 6, there appears to a typographical error in that the word balance is spelled as "balanc".

II. In claim 9, line 1, there appears to a typographical error in that the word method is spelled as "m thod".

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9 to 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The scope of the carbon content encompassed by these claims is not clear.

According to claim 9, the carbon content is controlled on the one hand by the equation;

$$\% \text{ area fraction scale} = -0.193 \times \text{carbon content in ppm} + 86.$$

However, in accordance with Figure 2 (see specification, page 11, lines 7 to 10) this equation is valid only for carbon contents up to 450 ppm. On the other hand the claim language "effective to substantially reduce formation of an as-cast metallic scale"

relates to concentrations of about 0.04wt% (400 ppm) and above, including concentrations above 450 ppm (specification, page 5, the last line to page 6, line 1 and page 7, lines 9 to 13). Thus, in view of the fact that the equation in claim 9 limits the carbon content to a maximum of 450 ppm while the claim language, "effective to substantially reduce formation of an as-cast metallic scale" relates to concentrations of about 0.04wt% (400 ppm) and above, including concentrations above 450 ppm, it is not clear what carbon concentrations are being claimed.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 to 4, 9 to 11, 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Wukusick et al. (Wukusick, US Patent No. 5,100,484).

Wukusick teaches a method of making single crystal superalloy castings (Abstract) comprising casting alloys having compositions that are encompassed by the instant claims including preferably 0.04 to 0.06 weight % carbon and most preferably 0.05 weight % carbon (column 1, Table I). These carbon contents taught by Wukusick are encompassed by the carbon content disclosed by the applicants as the carbon content that is necessary to substantially reduce the formation of the as cast metallic surface scale when the super alloy is cast (specification, page 5, the last line to page 6,

Art Unit: 1742

line 1 and page 7, lines 9 to 13). Wukusick teaches that the superalloy is cast in a mold (column 2, line 12) and solution heat treated (column 2, line 67) as recited in the applicants' claims. Claims 1 to 4, 9 to 11, 17 and 18 are anticipated by Wukusick because there is reason to believe that the reduced scale required by the claims would be obtained when practicing Wukusick's preferred and most preferred embodiments, In re Best, 195 USPQ, 430 and MPEP 2112.01.

"Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established, In re Best, 195 USPQ 430, 433 (CCPA 1977). 'When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.' In re Spada, 15 USPQ2d 655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best, 195 USPQ 430, 433 (CCPA 1977)." see MPEP 2112.01.

6. Claims 1 to 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Mihalisin et al. (Mihalisin, US Patent No. 5,549,765).

Mihalisin teaches making single crystal nickel base alloys by casting in a mold (column 4, lines 40 to 45 ) an alloy having a composition that overlaps the alloy composition recited in the instant claims (column 3, lines 10 to 20). Mihalisin also teaches specific example alloys that are encompassed by the alloy compositions recited in the instant claims (columns 5 and 6, Tables 3 and 4 and column 9, Table 11, CMSX-4). The carbon contents of these specific example alloys taught by Mihalisin are encompassed by the carbon content disclosed by the applicants as the carbon content that is necessary to substantially reduce the formation of the as cast metallic surface

Art Unit: 1742

scale when the super alloy is cast (specification, page 5, the last line to page 6, line 1 and page 7, lines 9 to 13). Claims 1 to 20 are anticipated by Mihalisin because there is reason to believe that the reduced scale required by the claims would be obtained when practicing the specific example alloy embodiments taught by Mihalisin, *In re Best*, 195 USPQ, 430 and MPEP 2112.01.

"Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established, *In re Best*, 195 USPQ 430, 433 (CCPA 1977). 'When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.' *In re Spada*, 15 USPQ2d 655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 195 USPQ 430, 433 (CCPA 1977)." see MPEP 2112.01.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 to 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wukusick et al. (Wukusick, US Patent No. 5,100,484).

Wukusick teaches a single crystal nickel base alloy having a composition that overlaps the alloy composition recited in each of the applicants' claims (column 1, Table I, the Base composition). Even though Wukusick's base composition includes

Art Unit: 1742

anywhere from 0 to 0.07 weight % carbon Wukusick provides reasons for including small controlled amounts of carbon to increase the grain boundary strength (column 9, lines 1-20) which provides motivation for including carbon in amounts greater than zero.

Wukusick and the claims differ in that Wukusick does not teach the exact same proportions as recited in the instant claims.

However, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the alloy proportions taught by Wukusick overlap the instantly claimed proportions and therefore are considered to establish a prima facie case of obviousness. It would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference, particularly in view of the fact that;

“The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages”, In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

Further, Wukusick provides motivation to increase the carbon content of the alloy so as to increase the grain boundary strength of the alloy (column 9, lines 1 to 20).

Art Unit: 1742

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Sheehan whose telephone number is (571) 272-1249. The examiner can normally be reached on T-F (6:45-4:30) Second Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
John P. Sheehan  
Primary Examiner  
Art Unit 1742

jps